

IN THE SPECIFICATION

Please delete the Abstract on page 1 in its entirety and replace it with the following clean copy of the Abstract.

ABSTRACT**DEVICE OF A WORKING ELEMENT WITH TWO DEGREES OF MOBILITY**

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A working element with two degrees of mobility, which, with the assistance of two motors manages to move two movable links, one of them acting on the working element, this is a method which is distinguished in the simultaneous action on a working element with the assistance of another movable link. The guidance of a working element with two degrees of mobility which has two motors one of which is housed in the base and connected kinematically with an extreme of the first movable link located in the base with possibility of movement and the other motor connected kinematically with an extreme of the second movable link, and the working element which is connected with the other extreme of the second movable link.

Please replace the Section entitled BACKGROUND OF THE INVENTION beginning on page 2, line 8 and ending on page 3 line 27 with the following clean copy of that Section.

BACKGROUND OF THE INVENTION

In known technical solutions [1-5], the following is habitually employed.

The handler which is known, with two degrees of mobility, (figure 1) has two motors (2,3) one of which (2) is housed in the base and is kinematically connected with an extreme of the first movable link (5) housed in the base (1), with possibility of movement, and the other motor (3) is kinematically connected with an extreme of the second movable link (9) and the working element (4), which is connected with the other extreme (10) of the second movable link (6).

In this technical solution, the second motor (3) is fastened to the other extreme of the first movable link (5).

The drawbacks of this construction concern the fact that the second motor is mobile (during the movement of the first movable link this motor is in motion) which increases the mass of the parts in movement. This also reduces the speed and has an unnecessary energy consumption. In addition, the device known has an open kinematic train which leads to deficiencies in the stiffness of the construction and as a result thereof the need to augment the mass to improve this stiffness.

1. Industrial robot.

Patent number: EP 0320498

Publication date: 1989-06-14

Inventor(s): WINTER ALFRED ING; SCHENDL ADOLF DIPL-ING

EC Classification: B25J9/02B2 ; B25J18/02 ; B25J19/00D2 ; B23Q1/40 ; B23Q1/62A5 ; B23Q1/00B2 ; B23Q11/00C

2. High cadence industrial robot for moving a tool along three orthogonal Cartesian axes.

Patent number: EP0546592

Publication date: 1993-06-16

Inventor(s): VIVIER YVES CHARLES BERNARD (FR); FAYEL

EC Classification: B25J9/00H1 ; B25J9/02B

3. Robot for guiding movements and control method.

Patent number: EP0574330 A1 931215

Publication date: 1995-03-21

Inventor(s): LAVALLEE STEPHANE (FR); TROCCAZ JOCELYNE (FR)

EC Classification: G05B19/423

4. Climbing robot movable along a trestle structure, particularly of a pole for high-voltage overhead electric lines.

Patent number: EP 0401751

Publication date: 1990-12-12

Inventor(s): PARIS LUIGI (IT)

EC Classification: B62D57/024

5. Method for controlling the movements of an industrial robot at and near singularities.

Patent number: EP 0672507

Publication date: 1995-09-20

Inventor(s): SNELL JOHN-ERIC (SE)

EC Classification: B25J9/16L6

6. Patent Number: US 4,962,676 (1990)

Patent Number: US 5,964,124 (1999)

Patent Number: US 6,328,510 (2001)

Patent Number: US 5,886,494 (1999)

Patent Number: US 5,421,695 (1995)

Patent Number: US 5,248,923 (1993)

Patent Number: US 4,618,309 (1986)

Patent Number: US 4,256,947 (1981)

Patent Number: US RE37,731 E (2002)

Please replace the Section entitled BRIEF DESCRIPTION OF THE INVENTION beginning on line 29 of page 3 and ending at line 13 of page 4 with the following clean copy of that Section.

DESCRIPTION OF THE INVENTION

The method of displacement of a working element with two degrees of mobility, which, with the assistance of two motors manages to move two movable links, one of them acting on the working element, this is a method which is distinguished in the simultaneous action on a working element with the assistance of another movable link.

The device of a working element with two degrees of mobility as claimed, has two motors one of which is housed in the base and connected is kinematically with an extreme of the first link located in the base with possibility of movement and another motor connected kinematically with an extreme of the second movable link, and the working element which is connected with the other extreme of the second movable link, this guidance is that which is distinguished in the fact that the second motor is housed in the base and an extreme of the second movable link connected with this motor is stiffened in the base with possibility of movement and the other extreme of the first movable link is connected with the working element.

Please replace the Section entitled BRIEF DESCRIPTION OF THE DRAWINGS beginning at line 15 of page 6 and ending at line 6 of page 7 with the following clean copy of that Section.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1. The known guidance of movement of the link with two degrees of mobility.

Figure 2. The proposed guidance of movement of the link with two degrees of mobility.

Figure 3. Example of embodiment of the proposed guidance – the walking robot, in which four proposed guidance arrangements are being employed (viewed from above).

Figure 4. Example of embodiment of the proposed guidance – the walking robot, in which four proposed guidance arrangements are being employed (viewed from the side).

List of the numbering references of the elements shown in the Figures.

- 64
1. The base of the guidance arrangement
 2. The first motor
 3. The second motor
 4. The working element
 5. The first movable link
 6. The second movable link
 7. The first extreme of the first movable link
 8. The second extreme of the first movable link
 9. The first extreme of the second movable link
 10. The second extreme of the second movable link
 11. The foot of the robot with the guidance for vertical movement (this guidance is not shown in the drawing).
 12. Spring
 13. Self-blocking kinematic connection between at least one of the motors 3 and its corresponding movable link 6

Please replace the paragraph beginning at line 22 on page 7 and ending at line 5 of page 8 with the following clean copy of that paragraph.

b5.

In the device proposed, when there exists an articulated union between the working element and both movable links, there could be an additional spring (or springs) (12), one of its extremes connected with a movable link, the other extreme connected with the other link and its intermediate point connected with the working element. In such a case, if there are no external forces acting on the working element, the latter shall maintain its angular position with respect to the base. If external forces act on the working element, the latter can change its angular position relative to the base, but when these forces cease to act, the working element shall recuperate its angular position with respect to the base. This is important, especially when the operation is utilised for the horizontal actuation of the leg of a walking robot.

Please replace the paragraph on page 8 beginning at line 14 and ending at line 22 with the following clean copy of that paragraph.

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In the device proposed it is desirable (but not mandatory) to make a kinematic connection between at least one of the motors and the corresponding movable link with a self-blocking transmission (13) (for example with the aid of a nut and spindle assembly). In that case it is possible to disconnect the motors when the device is stopped and the working element can maintain its position due to the self-blocking effect. This shall permit a reduction in energy consumption.